

## Chlorine, Bleach and Baking Soda Formulations

### Making Household Bleach with Pool Shock

- Pool Shock active ingredient is Calcium Hypochlorite -  $\text{Ca}(\text{ClO})_2$
- Look for “available chlorine” or “strength of chlorine” or “free chlorine” to be > 70%. If pool shock is less than 70%, increase grams of shock used to make bleach in formula below
  - EX: If pool shock only has 35% available chlorine, then double the amount of shock used in the formula below.
- All references to “pool shock” in this document require the product to have available chlorine > 70%.

#### *The Formula*

75 grams of 70% (or greater)  $\text{Ca}(\text{ClO})_2$  into 1 liter of water → 5.25% bleach solution

(aka “household bleach”)

Note  $(0.7) \times 75\text{g} = 52.5\text{g}$  of active chlorine

1 liter of water=1,000 grams

52.5 grams of chlorine / 1,000 grams of water = 5.25% solution

**75 grams of pool shock ≈ 3 fluid ounces ≈ 1/3 cup + 1 Tbs**

### Water Purification with 5.25% Bleach Solution

- 1 liter of water: 2 drops (EPA formula); 5 drops (ProlongedFieldCare.org formula)
- 1 gallon of water: 9 drops (EPA formula); 20 drops (ProlongedFieldCare.org formula)
- 10 gallons of water: 1 teaspoon (EPA formula); 2 teaspoons (ProlongedFieldCare.org formula)

Note well: these formulas are not exactly linear given the minute amounts needed and the difficulty measuring such minute amounts precisely.

EPA instructions:

- Stir and let stand for 30 minutes. The water should have a slight chlorine odor. If it doesn't, repeat the dosage and let stand for another 15 minutes before use.
- If the chlorine taste is too strong, pour the water from one clean container to another and let it stand for a few hours before use.

**This will not kill Giardia or Cryptosporidium cysts. They will have to be removed with heat or filtration.**

## Chlorine, Bleach and Baking Soda Formulations

### Dakin's Solution<sup>1</sup>

*The following comes from the Nationwide Children's Hospital website. Print off the document in the footnote for your emergency binder for a full description of the guidance summarized below:*

	Full Strength	50% Strength	25% Strength	12.5% Strength
Bleach	3 oz (95mL)	3 Tbs + 0.5 tsp	1 Tbs + 2 tsp	2.5 tsp
Distilled Water	32 oz (1 L)	32 oz (1 L)	32 oz (1 L)	32 oz (1 L)

#### How to make distilled water

1. Measure 1 liter (4 cups) of tap water into a clean pot or pan.
2. Boil water for 15 minutes with the lid on the pan.
3. Remove from heat.
4. Use a clean measuring spoon to add half a teaspoon of baking soda to the boiled water.
5. Allow solution to cool completely with the lid on the pot before using

\*\*\*\*\*

#### ProlongedFieldCare.org Formula<sup>2</sup>:

“To make 0.025% Dakin's solution, mix 5mL of the household 5.25% bleach solution in a liter bottle with a teaspoon of baking soda.” Note this is 1/20<sup>th</sup> strength of regular Dakin's Solution.

---

<sup>1</sup> <https://www.nationwidechildrens.org/family-resources-education/health-wellness-and-safety-resources/helping-hands/dakins-solution> Nationwide Children's Hospital, Columbus OH

<sup>2</sup> <https://prolongedfieldcare.org/2018/04/20/the-white-powder-you-should-bring-on-every-deployment/>

## Chlorine, Bleach and Baking Soda Formulations

### **PPM Formulations using 5.25% Bleach**

*Note well: these formulas are not exactly linear given the minute amounts needed and the difficulty measuring such minute amounts precisely.*

5,250 PPM formula; 1:10 ratio

*Uses: sterilizing medical instruments, cleaning up bodily fluid spills*

- 29 fluid ounces of water; 3.2 fluid ounces of household bleach
- 29 fluid ounces of water; 6.5 Tbs of household bleach
- 29 fluid ounces of water; 75 g of pool shock

1,000 PPM formula; 1:50 ratio

*Uses: CDC formulation for coronavirus cleaning; also for pandemic cleaning and bathroom cleaning*

- 31 fluid ounces of water; 0.7 fluid ounces of household bleach
- 31 fluid ounces of water; 1 Tbs + 1 tsp of household bleach
- 31 fluid ounces of water; 15 g of pool shock

500 PPM formula; 1:100 ratio

*Uses: As directed by public health officials*

- 31 fluid ounces of water; 0.35 fluid ounces of household bleach
- 31 fluid ounces of water; 2 tsp of household bleach
- 31 fluid ounces of water; 7.5 g of pool shock

200 PPM formula; 1:250 ratio

*Uses: food processing equipment*

- 32 fluid ounces of water; 0.3 fluid ounces of household bleach
- 32 fluid ounces of water; 1 tsp of household bleach
- 32 fluid ounces of water; 3.0 g of pool shock

100 PPM formula; 1:500 ratio

*Uses: toys, eating utensils, food prep surfaces*

- 32 fluid ounces of water; 0.07 fluid ounces of household bleach
- 32 fluid ounces of water; 0.4 tsp of household bleach
- 32 fluid ounces of water; 1.5 g of pool shock